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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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NGUYEN, DUC M	

ART UNIT	PAPER NUMBER
2685	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/718,312	RAUSCH ET AL.	
	Examiner	Art Unit	
	Duc M. Nguyen	2685	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-62 and 64-68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,8-62 and 64-68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This action is in response to applicant's response filed on 5/13/05. Claims 1-6, 8-62, 64-68 are now pending in the present application.

Appeal Brief

1. In view of the Appeal Brief filed on 5/31/05, PROSECUTION IS HEREBY REOPENED. A new ground of rejection set forth below.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request must be accompanied by a supplemental appeal brief, but no new amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other evidence are permitted. See 37 CFR 1.193(b)(2).

Reason for a new ground of rejection

2. Based on the appeal brief filed on 5/13/05, it is noted that there are similar components with difference "terminology" used between this application and cited prior arts that the Applicant apparently does not recognize. The examiner would like to point them out in addition with several components which are implicitly disclosed by Csapo (US Pat No. **6411825**) to further clarify the new ground of rejection.

- Terminology : the "timing" signal and the "frequency" signal are interchangeable terminology that can be used for referring to an oscillating signal. Their only different is the unit expression, time is in second, frequency is in Hertz, wherein time in second = 1/frequency in Hertz.

- Block converter & mixer (or frequency converter): In page 17, Appellant states that

> "3. A block converter is inherently disclosed. Advisory Action, page 5, line 5. The Examiner did not find that the entire claimed block converter limitation is inherently disclosed in Csapo or any other reference, and it would be impossible for the Examiner to make such a claim. The entire block converter limitation is not disclosed in Csapo or any other cited reference inherently or explicitly. That limitation is the following: a block converter configured to convert the communication signal from the frequency to a stable lower frequency using the stabilized local oscillator signal."

Here, the above limitation of the block converter is just simply a "mixer" as illustrated in Figs. 2-3 and described in the last paragraph (line 23) of page 11 of the specification,

> "The LNBs 218 and 220 operate as **mixers** and down converters. The LNB 218 and 220 receive as inputs the high frequency signal from the LNAs 214 and....."

However, Appellant states that "The entire block converter limitation is not disclosed in Csapo or any other cited reference inherently or explicitly". Applicant is directed to Csapo (see col. 4, lines 43-53), which clearly implicitly teach a frequency converter (or mixer) which functions in the same way as of the block converter, for converting a high frequency signal to a low frequency signal and vice versa (see also US 5,936,754 to **Ariyavistakul** et al, col. 6, lines 21-24 regarding the frequency converter and the mixer.

Also note for the use of optical transmitter and optical receiver when transmitting signals over the optical fiber in Fig. 4, and col. 5, line 56 – col. 6, line 3 of **Ariyavistakul's** reference). Therefore, it appears that Appellant fails to recognize the relevance between the "block converter" and the frequency converter (or mixer).

- Stabilizing system & Frequency synthesizer : the "stabilizing system" and the "frequency synthesizer" are both a system which provides a stabilized local oscillator signal to the "mixer" (referred as "block converter" in this application), in order to convert an RF signal to another signal having another frequency. In fact, the frequency "synthesizer" provides a stabilized oscillator signal as of the "stabilizing system" that provides a "stable" timing signal to an oscillator to generate a "stable" oscillator signal, the only question remain is how stable it is as compared to the claimed "stabilizing system" (i.e, see US 5,881374 to **Osterberg**, col. 1, lines 50-61 regarding the frequency "synthesizer" and the "stability" feature). Therefore, the frequency "synthesizer" would read on the "stabilizing system" with the broadest reasonable interpretation, or at least relate to the claimed "stabilizing system" and the "block converter" (i.e, the synthesizer receives a stabilize timing signal and provides the stabilize oscillator signal to the "block converter" for frequency converter). However, in page 10, 6th paragrapth, Applicant states that

"The Examiner stated that Csapo discloses a frequency synthesizer. A frequency synthesizer is not relevant to the claimed invention. Appellant does not claim a frequency synthesizer and does even discuss a frequency synthesizer in its application. It is not relevant to the claimed invention, to any obviousness analysis, or to combining any references."

Therefore, it is clear that Appellant fails to recognize the relevance of the frequency "synthesizer" to the "stabilizing system" and the "block converter".

3. However, there is a main controversy in this "lengthy" Appeal brief regarding whether or not the GPS signal in Csapo's reference, that provides accurate lock and frequency signals to the main unit and the remote unit (PRU) (see Csapo, col. 7, lines 22-27), would be obvious to one skilled in art to modify Csapo to utilize such GPS signal to provide a "stable" timing signal to the PRU for generating a "stabilized" oscillator signal. Since most of the appeal brief content that the secondary references (US 6,163,294 to Talbot and Us 5,982,322 to Bickley) are not relate to a base station, and since the examiner has found new references wherein a base station uses GPS signals as a source of a common time base to periodically correct the stability of the oscillator, it is believed that a new ground of rejection would provide a better prosecution of this application. Therefore, PROSECUTION IS HEREBY REOPENED and a new ground of rejection set forth below.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

5. Claims **8-9** are rejected under 35 U.S.C. 102(a) as being anticipated by **Georges** et al (US **6,014,546**).

Regarding claim **8,** Georges discloses a system comprising:

an antenna configured to receive a communication signal at a communication tower (see Fig. 9 and col. 4, lines 58-67);

a stabilizing system configured to generate a stable timing signal (see col. 4, lines 58-67), the stabilizing system comprising:

a timing source configured to generate the stable timing signal (see Fig. 1, ref. 66 and col. 7, lines 30-42);

a stabilized local oscillator configured to receive the stable timing signal and to use the stable timing signal as an input to generate a stabilized oscillator signal (see Fig. 4, ref. 58 and col. 9, lines 18-37); and

a converting system configured to convert the communication signal from the frequency to a stable lower frequency using the stabilized oscillator signal (see col. 9, lines 33-38).

Here, based on Applicant's disclosure regarding the rubidium oscillator timing source (see specification, page 14, lines 5-7), it is clear that the global reference oscillator 66 of Georges's reference (see col. 9, lines 66-67) and the claimed "timing source" are directed to the same subject matter. Also note that the "global reference tone" and the "stable timing signal" are just different "terminology" but refer to the same subject matter. Therefore, the claimed limitations are anticipated by Georges.

Regarding claim **9**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Georges discloses a "block converter" as claimed (see col. 9, lines 34-37).

Claim Rejections - 35 USC ∋ 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims **1-5, 14, 16-21, 23, 28, 31, 35-38, 40, 45, 48-49, 54, 56-60** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Georges** in view of **Ariyavisitakul** et al (US Pat No. **5,936,754**).

Regarding claims **1-5, 14, 17, 21, 28, 31, 35-37, 40, 45, 48, 54, 56-59**, the claims are rejected for the same reason as set forth in claim 8 above. However, Georges fails to disclose an optical conversion system. However, since **Georges** suggests that a fiber-optic cable can be used for transmission, it is clear that when using the fiber-optic cable for transmission, an optical conversion system as claimed would obviously be used as disclosed by **Ariyavisitakul** (see Fig. 4 and col. 6, lines 4-30), in order transmit the electrical RF signal over the fiber-optic cable.

Regarding claims **18-20, 49,** the claims are rejected for the same reason as set forth in claim 1 above. In addition, **Georges** would disclose an "inserter" as claimed (see col. 7, lines 54-60). Further, since AC power is used for operating the system (see **Georges**, col. 11, lines 63-67), it is clear that a transformer would be needed to transform power from a first level to a second level as claimed (i.e, 110 or 220 V), in order to provide a suitable power supply to the system.

Regarding claim **21**, the claim is rejected for the same reason as set forth in claim 20 above. In addition, it is clear that a power distributor would be needed in order to supply power to each component of the system (see **Georges**, col. 11, lines 63-67).

Regarding claims **16, 38, 60**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Georges** and **Ariyavisitakul** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

8. Claims **30, 32, 41-42, 44, 55, 64, 66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Georges** in view of **Ariyavisitakul** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Georges fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Georges** suggests that the system can belong to other RF bandwidths such as satellite television, interactive multi-media video, high bit-rate local area networks, it a fiber-optic cable can be used for transmission (see col. 8, lines 22-

36), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Georges to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing Internet access to subscribers.

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

9. Claims **1-6, 8-10, 14-17, 22-26, 28-29, 31, 35-40, 45-52, 54, 56-62, 67** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Rudow et al** (US Pat No. **5,689,431**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (also known as mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter";

- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic transmitter when using the fiber cable for transmission;
- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;
- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such converting system when using a fiber-optic cable for transmission;
- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);

- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, Csapo fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, **Rudow** disclose a system wherein a base station and carts use the GPS "stable" timing signal to recalibrate clock errors of the oscillators caused by temperature drift, for improving stability of the oscillators in order to obtain a good synchronization (see Fig. 1 , col. 6, lines 53-56, col. 7, lines 30-35, col. 9, lines 35-37, col. 14, lines 31-48 and col. 35, lines 57-63). Since **Csapo** further discloses that the GPS provides "accurate clock" and "frequency signals" to the main unit PMU and the remote unit PRU (see **Csapo**, **col. 7, lines 22-27**), it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the above teachings of **Rudow** to **Csapo** for using the GPS timing (or "accurate clock") signal to recalibrate clock errors of the oscillators of the PMU and of the PRU as well, thereby result in generating a "stabilized" oscillator signal as claimed, for improving the stability of the oscillators. Therefore, by providing the GPS timing to calibrate the oscillators, this would generate a "stabilized" local oscillator signal to the frequency converter, it is clear that Csapo as modified would disclose a "frequency converter" that would mix a communication signal with the "stabilized" local oscillator signal, thereby convert the frequency of the communication signal to a "stable" lower (IF) frequency signal, and would convert the "stable" lower (IF) frequency signal to an optical signal

when using a fiber-optic cable for transmission, this would read on a "block coverter" or a "converter system" as claimed.

Regarding claims **1-6, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67** it is clear that **Csapo** as modified would disclose block converter, GPS timing source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same reason as set forth in claim **8** above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo** and **Rudow** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

10. Claims **30, 32, 41-42, 44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Rudow** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Csapo fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Csapo to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claim **65**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Csapo as modified would disclose a GPS stable timing signal (see **Rudow**, col. 14, lines 31-36).

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

11. Claims **11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Rudow** and **Quayle** and further in view of **Nielsen** et al (US Pat No. **6,194,970**).

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed **high** relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further incorporate **Nielsen's** teaching to modify **Quayle, Csapo** and **Rudow** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

12. Claims **33-34** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of in view of **Rudow** and further in view of **Komara** (US Pat No. **6,161,024**).

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of redundant components in a communication system is well known in the art for backup failure components as disclosed by **Komara** (see Fig. 1 and col. 2, lines 15-40), it would have been obvious to one skilled in the art at the time the invention was made to incorporating **Komara** 's teaching to **Csapo** and **Rudow** to comprise such redundant components as recited in the claims, for providing a back up system to minimize disruptions of the communication system.

Regarding claim **34**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, it would have been obvious to one skilled in the art to provide

a selector for redundant optic transceiver as claimed, in order to select only the current active optical signal for processing.

13. Claims **1-6, 8-10, 14-17, 22-29, 31, 35-40, 45-54, 56-62, 67-68** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Nielsen et al** (US Pat No. **6,194,970**) and **Bickley et al** (US Pat No. **5,982,322**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (sometime called mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter"
- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic transmitter when using the fiber cable for transmission;

- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;
- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such converting system when using a fiber-optic cable for transmission;
- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);
- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, Csapo fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, it is noted that since Csapo discloses that the GPS provide "accurate clock" and "frequency signals" to the main unit and the remote unit (PRU) (see **Csapo, col. 7, lines 22-27**), it would have been obvious to one of ordinary skill in the art that such GPS "stable" timing signal would obviously be used as common time (or system timing reference) for the base station to compensate or periodically calibrate the timing reference of the oscillator as disclosed by **Nielsen** (see col. 3, lines 5-15, col. 4, lines 1-7 and col. 4, lines 50-56). By using the GPS "stable" timing signal as common time (or system timing reference) for the base station to compensate or periodically calibrate to timing reference of the oscillator, it is clear that the GPS timing signal would be used to calibrate the timing reference of the stable master oscillator of the frequency synthesizer, which in turn provide a stabilized oscillator signal to the frequency converter (or mixer) of a transceiver device as discussed by by **Bickley** (see **Figs. 3-4** and **col. 8, lines 1-19**). Therefore, by providing the GPS "timing signal" as a system timing reference for the base station to calibrate the stable master oscillator of the frequency synthesizer as disclosed by Nielse and Bickley, the claimed limitation are made obvious by **Csapo, Nielsen** and **Bickley**, for using a GPS timing signal to improve the stability of the oscillators of the base station.

Regarding claims **1-6, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67**, it is clear that **Csapo** as modified would disclose block converter, GPS timing source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same

reason as set forth in claim 8 above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo, Nielsen** and **Bickley** to further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

Regarding claims **27, 53, 68**, the claims are rejected for the same reason as set forth in claim 1 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed high relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further modify **Csapo, Nielsen** and **Bickley** to place the GPS receiver at the upper

portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

14. Claims **33-34** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Nielsen** and **Bickley** and further in view of **Komara** (US Pat No. **6,161,024**).

Regarding claim **33**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of redundant components in a communication system is well known in the art for backup failure components as disclosed by **Komara** (see Fig. 1 and col. 2, lines 15-40), it would have been obvious to one skilled in the art at the time the invention was made to incorporating **Komara** 's teaching to **Csapo, Nielsen** and **Bickley** to comprise such redundant components as recited in the claims, for providing a back up system to minimize disruptions of the communication system.

Regarding claim **34**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, as clearly seen in Fig. 1 of **Nielsen** regarding the redundant GPS receiver and selector 108 (see also col. 3, lines 44-54), it would have been obvious to one skilled in the art to provide a selector for redundant optic transceiver as well, in order to select only the current active optical signal for processing.

15. Claims **11-13, 30, 32, 41-44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Nielsen** and **Bickley** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-44, 55, 64-66**, the claims are rejected for the same reason as set forth in claim 27 above. However, **Csapo** as modified fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo, Nielsen** and **Bickley** to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed high relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further modify **Quayle, Csapo, Nielsen** and **Bickley** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

16. Claims **1-6, 8-10, 14-17, 22-26, 28-29, 31, 35-40, 45-52, 54, 56-62, 67** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo et al** (US Pat No. **6411825**) in view of **Gehrke et al** (US Pat No. **6,185,429**).

Regarding claims **8, 35, 57**, **Csapo** discloses a wireless communication system comprising an antenna located at a communication tower (see **Fig. 9** and **col. 6, lines 28-42**), comprising:

- a communication tower (see Fig. 9);
- an antenna (see Fig. 9, ref. 120);
- a frequency converter (implicitly disclose in col. 4, lines 43-50), wherein in order to convert a high frequency signal to a low frequency signal and vice versa, a frequency converter (sometime called mixer) is needed. Since "the block conveter" is just a mixer or frequency converter (see specification, line 23 of page 11), the frequency converter would read on the "block converter"
- a fiber optic transmitter (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optical/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic transmitter when using the fiber cable for transmission;
- a fiber optic receiver (see col. 6, lines 55-59), wherein it is clear that in order to provide an optical signal that will be less lossy than an electric signal, an optic/electrical conversion and an optic transmitter-receiver should be utilized. Therefore, Csapo would obviously disclose a fiber optic receiver when using the fiber-optic cable for transmission;
- a converting system configured to convert a communication signal to a lower frequency signal, and to convert the lower frequency signal to an optical

signal, and to transmit the optical signal to an optical receiving system (see col. 4, lines 43-50 and col. 6, lines 55-59). Since Csapo discloses a frequency converter, a fiber optic transmitter and a fiber optic receiver as explained above in the preceding paragraphs, it is clear that Csapo would obviously disclose such a converting system when using a fiber-optic cable for transmission;

- a stable timing source located at a base of a tower (see Fig. 13, ref. 140 regarding GPS receiver, Time & Frequency Generator and col. 7, lines 22-26), wherein it is clear that the GPS timing signal is a "stable" timing signal (see specification, page 8, line 6);
- a GPS receiver (see Fig. 13, ref. 140);
- amplifiers (PA and LNA), a filter (see col. 7, lines 30-45);
- a frequency synthesizer (see), which would inherently generate a stabilized local oscillator signal;

However, **Csapo** fails to disclose the GPS "stable" timing signal is used to generate a "stable" oscillator signal. However, **Gehrke** disclose a base station wherein the GPS "stable" timing signal is used to periodically correct clock errors of the oscillators, for improving stability of oscillators in order to provide good synchronization system (see **Fig. 2, ref. 208** and **col. 4, lines 13-19, col. 2, lines 9-24**). Since **Csapo** further discloses that the GPS provides "accurate clock" and "frequency signals" to the main unit and the remote unit (PRU) (see **Csapo, col. 7, lines 22-27**), it would have been obvious to one of ordinary skill in the art at the time the invention was made to

provide the above teachings of **Gehrke** to **Csapo** for using the GPS timing (or "accurate clock") signal to recalibrate clock errors of the oscillators of the PMU and of the PRU as well, thereby result in generating a "stabilized" oscillator signal as claimed, for improving the stability of the oscillators. Therefore, by providing the "stabilized" local oscillator signal to the frequency converter, it is clear that Csapo as modified would disclose a "frequency converter" that would mix a communication signal with the "stabilized" local oscillator signal, thereby convert the frequency of the communication signal to a "stable" lower (IF) frequency signal, and would convert the "stable" lower (IF) frequency signal to an optical signal when using a fiber-optic cable for transmission, this would read on a "block coverter" or a "converter system" as claimed.

Regarding claims **1-6, 9-10, 14-17, 22, 24-26, 29, 31, 36-40, 45-48, 50-52, 56, 58-62, 67** it is clear that **Csapo** as modified would disclose block converter, GPS timing source, external receiver (GPS receiver), amplifier, filter, optic transmitter and optic receiver (when using a fiber-optic cable for transmission) as claimed, for the same reason as set forth in claim **8** above. Also note that the filter in Csapo's reference would obviously filter at least one member of a group comprising emissions and another communication as claimed, for improving signal reception quality.

Regarding claim **23**, the claim is rejected for the same reason as set forth in claim 1 above. In addition, since the use of a suppressor is well known in the art (Official Notice), for suppressing interferences, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify **Csapo** and **Gehrke** to

further provide a suppressor to suppress interferences as claimed, for improving signal reception quality.

Regarding claims **28, 49, 54**, the claims are rejected for the same reason as set forth in claim 1 above. In addition, since the GPS receiver of the PMU is located at a base of a tower, it is clear that **Csapo** as modified would disclose the GPS signal or stable timing signal is transmitted at a base of a tower as claimed (see **Csapo**, Fig. 9 and col. 8, lines 56-59), and would be inserted on a transmission medium to provide the timing signal to the oscillator of the frequency synthesizer.

17. Claims **30, 32, 41-42, 44, 55, 64-66** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Gehrke** and further in view of **Quayle** et al (US Pat No. **6,865,169**).

Regarding claims **30, 32, 41-42, 55, 64**, the claims are rejected for the same reason as set forth in claim 1 above. However, Csapo fails to disclose a MMDS signal. However, **Quayle** discloses a base station which operates in MMDS bands (see col. 3, lines 10-31). Since **Csapo** suggests that the system can support a variety of protocols (see col. 7, lines 16-22), it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Csapo to support MMDS system as disclosed in **Quayle**'s reference as well, for utilizing advantages of MMDS bandwidth such as providing high speed Internet access to subscribers.

Regarding claim **65**, the claim is rejected for the same reason as set forth in claim 8 above. In addition, Csapo as modified would disclose a GPS stable timing signal (see **Gehrke**, Fig. 2, ref. 208).

Regarding claims **44, 66**, the claims are rejected for the same reason as set forth in claim 8 above. In addition, it would have been obvious to one of ordinary skill in the art to provide an amplifier as claimed, for improving signal reception quality.

18. Claims **11-13** are rejected under 35 U.S.C. 103(a) as being unpatentable by **Csapo** in view of **Gehrke** and **Quayle** and further in view of **Nielsen** et al (US Pat No. **6,194,970**).

Regarding claims **11-13,** the claims are rejected for the same reason as set forth in claim 30 above. However, **Csapo** fails to disclose the GPS signal or stable timing signal is located at the upper portion of a tower. However, since **Nielsen** suggests that the GPS receiver be placed **high** relative to the surrounding terrain (see **col. 1, lines 50-52**), it would have been obvious to one skill in the art at the time the invention was made to further incorporate **Nielsen's** teaching to modify **Quayle, Csapo** and **Gehrke** to place the GPS receiver at the upper portion of a tower, for improving signal reception quality due to closer distance to GPS satellites while reducing the blockage of GPS satellite signals caused by tall buildings.

Response to Arguments

19. Applicant's arguments with respect to claims 1-6, 8-62, 64-68 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Osterling (US 5,870,001), Apparatus and associated method for calibrating a device.

Judd et al (US 6,695,325), Transmit/receive distributed antenna systems.

Weissman et al (US 2002/0039885), Split repeater.

21. **Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571) 273-8300 (for formal communications intended for entry)

(571)-273-7893 (for informal or draft communications).

Hand-delivered responses should be brought to Customer Service Window, Randolph Building, 401 Dulany Street, Alexandria, VA 22314.

Any inquiry concerning this communication or communications from the examiner should be directed to Duc M. Nguyen whose telephone number is (571) 272-7893, Monday-Thursday (9:00 AM - 5:00 PM).

Or to Edward Urban (Supervisor) whose telephone number is (571) 272-7899.

Duc M. Nguyen

July 28, 2005